

IN THE
UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): Randy L. Hoffman, et al.

Confirmation No.:

Application No.:

Examiner:

Filing Date: Herewith

Group Art Unit:

Title: SEMICONDUCTOR DEVICE

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT

Sir:

This Information Disclosure Statement is submitted:

- ☒ under 37 CFR 1.97(b), or
(Within three months of filing national application; or date of entry of national application; or before mailing date of first office action on the merits; whichever occurs last)
- ☐ under 37 CFR 1.97(c) together with either a:
☐ Statement under 37 CFR 1.97(e), or
☐ a \$180.00 fee under 37 CFR 1.17(p), or
(After the CFR 1.97 (b) time period, but before final action or notice of allowance, whichever occurs first)
- ☐ under 37 CFR 1.97 (d) together with a:
☐ Statement under 37 CFR 1.97(e)(1) or (2), and
☐ a \$180.00 fee set forth in 37 CFR 1.17(p).
(Filed after final action, a notice of allowance, on or before payment of the issue fee)

Please charge to Deposit Account **08-2025** the sum of \$0.00. At any time during the pendency of this application, please charge any fees required or credit any overpayment to Deposit Account **08-2025** pursuant to 37 CFR 1.25.

☒ Applicant(s) submit herewith Form PTO 1449 - Information Disclosure Statement together with any required copies of patents, publications or other information of which applicant(s) are aware, which applicant(s) believe(s) may be material to the examination of this application and for which there may be a duty to disclose in accordance with 37 CFR 1.56.

☐ A concise explanation of the relevance of foreign language patents, foreign language publications and other foreign language information listed on PTO Form 1449, as presently understood by the individual(s) designated in 37 CFR 1.56 (c) most knowledgeable about the content is given on the attached sheet, or where a foreign language patent is cited in a search report or other action by a foreign patent office in a counterpart foreign application, an English language version of the search report or action which indicates the degree of relevance found by the foreign office is listed on form PTO 1449 and is enclosed herewith.

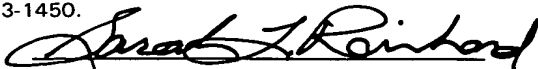
It is requested that the information disclosed herein be made of record in this application.

"Express Mail" label no. EV372029231US

Date of Deposit 03/12/2004

I hereby certify that this is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to: Commissioner for Patents, Alexandria, VA 22313-1450.

By

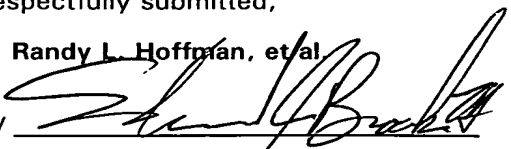


Typed Name: Sarah L. Reinhard

Respectfully submitted,

Randy L. Hoffman, et al

By



Edward J. Brooks III

Attorney/Agent for Applicant(s)
Reg. No. 40,925

Date: 03/12/2004

FORM PTO-1449 LIST OF PATENTS AND PUBLICATIONS FOR APPLICANT'S INFORMATION DISCLOSURE STATEMENT (Use several sheets if necessary)	ATTY. DOCKET NO.	APPLICATION NO.	CONFIRMATION NO.
	200316546-1		
	APPLICANT		
	Randy L. Hoffman, et al.		
	FILING DATE	GROUP	
	Herewith		

REFERENCE DESIGNATION

U.S. PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER	PUBLICATION DATE	NAME	Pages, Columns, Lines Where Relevant Passages or Figures Appear
	1A	5,744,864	08/28/1998	Cillessen, et al.	
	1B	2003/0047785	03/13/2003	Yamazaki	
	1C	2003/0111663	06/19/2003	Yagi	
	1D	2003/0218221	11/27/2003	Wager, III, et al.	
	1E	2003/0218222	11/27/2003	Wager, III, et al.	
	1F	60/490,239	07/25/2003		Transparent Thin Film Transistor with Zinc-Tin Oxide Channel...
	1G	10/763,353	01/25/2004		Semiconductor Device
	1H	10/763,354	01/23/2004		Transistor Including a Deposited Channel Region Having a...
	1I				
	1J				
	1K				

FOREIGN PATENT DOCUMENTS

		DOCUMENT NUMBER	PUBLICATION DATE	NAME OF PATENTEE OR APPLICANT	Pages/Columns/Lines Where Relevant Passages/Figures Appear	Check if Translation attached
	1L	WO 97/006544	02/20/1997	Cillessen, et al.		E
	1M	EP1134811	09/19/2001	Kawasaki, et al.		
	1N					
	1O					
	1P					

OTHER REFERENCES (including Author, Title, Date, Pertinent Pages, etc.)

	1Q	Aoki, Akira, et al., "Tin Oxide Thin Film Transistors", Japan J. Appl. Phys., Vol. 9, p.582 (1970).
	1R	Carcia, P.F., et al., "Transparent ZnO thin-film transistor fabricated by rf magnetron sputtering", Applied Physics Letters, Vol. 82, No. 7, pp. 1117-1119 (February 17, 2003).
	1S	Carcia, P.F., et al., "ZnO Thin Film Transistors for Flexible Electronics", Mat. Res. Soc. Symp. Proc., Vol. 769, pp. H72.1-H72.6 (2003).

EXAMINER

DATE CONSIDERED

FORM PTO-1449 LIST OF PATENTS AND PUBLICATIONS FOR APPLICANT'S INFORMATION DISCLOSURE STATEMENT (Use several sheets if necessary)	ATTY. DOCKET NO.	APPLICATION NO.	CONFIRMATION NO.
	200316546-1		
	APPLICANT		
	Randy L. Hoffman, et al.		
	FILING DATE	GROUP	
	Herewith		

REFERENCE DESIGNATION

U.S. PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER	PUBLICATION DATE	NAME	Pages, Columns, Lines Where Relevant Passages or Figures Appear
	2A				
	2B				
	2C				
	2D				
	2E				
	2F				
	2G				
	2H				
	2I				
	2J				
	2K				

FOREIGN PATENT DOCUMENTS

		DOCUMENT NUMBER	PUBLICATION DATE	NAME OF PATENTEE OR APPLICANT	Pages/Columns/Lines Where Relevant Passages/Figures Appear	Check if Translation attached
	2L					
	2M					
	2N					
	2O					
	2P					

OTHER REFERENCES (including Author, Title, Date, Pertinent Pages, etc.)

2Q	Fu, Shelton, et al., "MOS and MOSFET with Transistion Metal Oxides", SPIE Vol. 2697, pp. 520-527.
2R	Giesbers, J.B., et al., "Dry Etching of All-Oxide Transparent Thin Film Memory Transistors", Microeletronic Engineering, Vol. 35, pp. 71-74 (1997).
2S	Grosse-Holz, K.O., et al. "Semiconductive Behavior of Sb Doped SnO2 Thin Films", Mat. Res. Soc. Symp. Proc., Vol. 401, pp. 67-72 (1996).

EXAMINER	DATE CONSIDERED
----------	-----------------

FORM PTO-1449

LIST OF PATENTS AND PUBLICATIONS FOR
APPLICANT'S INFORMATION DISCLOSURE
STATEMENT

(Use several sheets if necessary)

ATTY. DOCKET NO.

200316546-1

APPLICATION NO.

CONFIRMATION NO.

APPLICANT

Randy L. Hoffman, et al.

FILING DATE

Herewith

GROUP

REFERENCE DESIGNATION

U.S. PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER	PUBLICATION DATE	NAME	Pages, Columns, Lines Where Relevant Passages or Figures Appear
		3A			
		3B			
		3C			
		3D			
		3E			
		3F			
		3G			
		3H			
		3I			
		3J			
		3K			

FOREIGN PATENT DOCUMENTS

		DOCUMENT NUMBER	PUBLICATION DATE	NAME OF PATENTEE OR APPLICANT	Pages/Columns/Lines Where Relevant Passages/Figures Appear	Check if Translation attached
		3L				
		3M				
		3N				
		3O				
		3P				

OTHER REFERENCES (including Author, Title, Date, Pertinent Pages, etc.)

	3Q	Hoffman, R.L., et al., "ZnO-based transparent thin-film transistors", Applied Physics Letters, Vol. 82, No. 5, pp. 733-735 (February 3, 2003).
	3R	Masuda, Satoshi, et al., "Transparent thin film transistors using ZnO as an active channel layer and their electrical properties", Journal of Applied Physics, Vol. 93, No. 3, pp. 1624-1630 (February 1, 2003).
	3S	Nishi, Junya, et al., "High Mobility Thin Film Transistors with Transparent ZnO Channels", Jpn. J. Appl. Phys., Vol. 42, Part 2, No. 4A, pp. L347-L349 (April, 2003).

EXAMINER

DATE CONSIDERED

FORM PTO-1449

LIST OF PATENTS AND PUBLICATIONS FOR
APPLICANT'S INFORMATION DISCLOSURE
STATEMENT

(Use several sheets if necessary)

ATTY. DOCKET NO.

200316546-1

APPLICATION NO.

CONFIRMATION NO.

APPLICANT

Randy L. Hoffman, et al.

FILING DATE

Herewith

GROUP

REFERENCE DESIGNATION

U.S. PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER	PUBLICATION DATE	NAME	Pages, Columns, Lines Where Relevant Passages or Figures Appear
	4A				
	4B				
	4C				
	4D				
	4E				
	4F				
	4G				
	4H				
	4I				
	4J				
	4K				

FOREIGN PATENT DOCUMENTS

		DOCUMENT NUMBER	PUBLICATION DATE	NAME OF PATENTEE OR APPLICANT	Pages/Columns/Lines Where Relevant Passages/Figures Appear	Check if Translation attached
	4L					
	4M					
	4N					
	4O					
	4P					

OTHER REFERENCES (including Author, Title, Date, Pertinent Pages, etc.)

	4Q	Ohya, Yutaka, et al., "Thin Film Transistor of ZnO Fabricated by Chemical Solution Deposition", Jpn. J. Appl. Phys., Vol. 40, Part 1, No. 1, pp. 297-298 (January, 2001).
	4R	Pallecchi, Ilaria, et al. "SrTiO ₃ -based metal-insulator-semiconductor heterostructures" Applied Physics Letters, Vol. 78, No. 15, pp. 2244-2246 (April 9, 2001).
	4S	Prins, M. W. J., et al., "A ferroelectric transparent thin-film transistor", Appl. Phys. Lett., Vol. 68, No. 25, pp. 3650-3652 (June 17, 1996).

EXAMINER

DATE CONSIDERED

FORM PTO-1449

LIST OF PATENTS AND PUBLICATIONS FOR
APPLICANT'S INFORMATION DISCLOSURE
STATEMENT

(Use several sheets if necessary)

ATTY. DOCKET NO.

200316546-1

APPLICATION NO.

CONFIRMATION NO.

APPLICANT

Randy L. Hoffman, et al.

FILING DATE

Herewith

GROUP

REFERENCE DESIGNATION

U.S. PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER	PUBLICATION DATE	NAME	Pages, Columns, Lines Where Relevant Passages or Figures Appear
	5A				
	5B				
	5C				
	5D				
	5E				
	5F				
	5G				
	5H				
	5I				
	5J				
	5K				

FOREIGN PATENT DOCUMENTS

		DOCUMENT NUMBER	PUBLICATION DATE	NAME OF PATENTEE OR APPLICANT	Pages/Columns/Lines Where Relevant Passages/Figures Appear	Check if Translation attached
	5L					
	5M					
	5N					
	5O					
	5P					

OTHER REFERENCES (including Author, Title, Date, Pertinent Pages, etc.)

5Q	Seager, C.H., et al., "Charge Trapping and device behavior in ferroelectric memories", Appl. Phys. Lett., Vol. 68, No. 19, pp. 2660-2662 (May 6, 1996).
5R	Uneno, K., et al. "Field-effect transistor on SrTiO ₃ with sputtered Al ₂ O ₃ gate insulator", Applied Physics Letters, Vol. 83, No. 9, pp. 1755-1757 (September 1, 2003).
5S	Wöllenstein, Jürgen, et al., "An insulated gate thin-film transistor using SnO ₂ as semiconducting channel, a possible new gas sensor device" The 11th European Conference on Solid State Transducers, pp. 471-474 (September 21-24, 1997).

EXAMINER

DATE CONSIDERED

FORM PTO-1449

LIST OF PATENTS AND PUBLICATIONS FOR
APPLICANT'S INFORMATION DISCLOSURE
STATEMENT

(Use several sheets if necessary)

ATTY. DOCKET NO.

200316546-1

APPLICATION NO.

CONFIRMATION NO.

APPLICANT

Randy L. Hoffman, et al.

FILING DATE

Herewith

GROUP

REFERENCE DESIGNATION

U.S. PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER	PUBLICATION DATE	NAME	Pages, Columns, Lines Where Relevant Passages or Figures Appear
	6A				
	6B				
	6C				
	6D				
	6E				
	6F				
	6G				
	6H				
	6I				
	6J				
	6K				

FOREIGN PATENT DOCUMENTS

		DOCUMENT NUMBER	PUBLICATION DATE	NAME OF PATENTEE OR APPLICANT	Pages/Columns/Lines Where Relevant Passages/Figures Appear	Check if Translation attached
	6L					
	6M					
	6N					
	6O					
	6P					

OTHER REFERENCES (including Author, Title, Date, Pertinent Pages, etc.)

6Q	Yoshida, A., "Three Terminal Field Effect Superconducting Device Using SrTiO ₃ Channel" IEEE Transactions on Applied Superconductivity, Vol. 5, No. 2, pp. 2892-2895 (June, 1995).
6R	Solid-State Electronics, Vol. 7, Pergamon Press, Notes pp. 701-702 (1964).
6S	Anonymous, "Transparent and/or memory thin film transistors in LCD's and PLED_" Research Disclosure, p. 890 (July 1998).

EXAMINER

DATE CONSIDERED